

Central Valley Salmonid Satellite Project Work Team Juvenile Monitoring PWT

Meeting Notes

10:00 to 15:00 August 31, 2005

Department of Water Resources-Environmental Services Office, Sacramento, CA.

Participants: Bill Poytress (chair-FWS), David Colby (FWS), Richard Corwin (USBR), Ryon Kurth (DWR), Jason Kindopp (DWR), Shea Gaither (FWS), Tracy McReynolds (DFG), Erin Chappell (DWR), John Williams, Robert Vincik (DFG), J.D. Wikert (FWS/AFRP), Arnold Ammann (NOAA), Michelle Workman (EBMUD), Jason Ogawa (FWS), Shane Quinn (YTFP), Tony Heacock (FWS).

I. Introductions and Announcements – No announcements.

II. Modify/Adopt agenda – No modifications, agenda adopted.

III. Discuss/Amend/Approve meeting notes (5-19-05) – **B. Poytress** indicated that he has not yet incorporated some of the May meeting's review comments and therefore the minutes are still in Draft form. There is still time for comments or edits, email or call Bill.

IV. Discussion topic: Juvenile Salmonid Marking Techniques and Basin-Wide Monitoring Station Mark Coordination Meeting.

A) Round-table discussion of salmonid marking plans for the upcoming season. Summary of marking plans in order from upper Sacramento River and tributaries to Delta:

<u>Principal Investigator</u>	<u>Affiliation</u>	<u>Stream/River/Area</u>	<u>Mark(s) to be used</u>	<u>Intent / Purpose of Marking</u>
Arnold Amman	NOAA	Battle Creek/CNFH steelhead trout & late-fall Chinook	Vemco Acoustic Tag - Scheduled for Jan 2007	Track migration and survival from Battle Creek to Golden Gate Bridge
Shea Gaither	USFWS	Clear Creek, Battle Creek	Bismark Brown and upper and lower caudal clips	Evaluate RST efficiency
Bill Poytress	USFWS	Upper Sacramento River @ RBDD	Bismark Brown and possible spray-dye	Evaluate RST efficiency/perform paired releases of different size class Chinook to evaluate fish size in relation to efficiency.
Rich Corwin	BOR	RBDD Research Pumping Plant	Bismark Brown	Evaluate survival/entrainment of salmon at 2 nd internal helical pump that is currently being installed.
Tracy McReynolds	DFG	Butte Creek	CWT-Spring Chinook	CWT 400,000 SCS from Jan-Mar to evaluate survival and return rates.
Jason Kindopp	DWR	Feather River	Bismark and Elastomer, 500K CWT, pit tag STT	Evaluate RST efficiency, wildstock tagging of fall/spring Chinook, pit tag study of steelhead trout for growth data
Robert Vincik	DFG	Knights Landing Traps	Bismark Brown	Evaluate RST efficiency
Michelle Workman	EBMUD	Mokelumne	CWT up to 40k fall Chinook, caudal clips for fry RST efficiency, Photonics for larger juveniles-RST efficiency	Fall run return rates (cwt), Evaluation of RST efficiency
Tony	USFWS-	Trinity	Bismark Brown	Evaluate RST efficiency

General Comments/Discussion regarding marking plans for the upcoming season:

R. Vincik will be calling in to DAT weekly conference calls this season reporting Knight's Landing trapping data. The American River rotary traps may or may not be deployed this coming season due to uncertain funding.

T. McReynolds noted that they will again attempt to CWT up to 400K spring Chinook juveniles. Last year they marked all of their fish in a relatively short time period. Previously they were only able to mark <150K. The CWT project currently has two more years of funding, after which they will continue to look for CWT returns for the following four years. **J.D. Wikert** asked if Tracy had looked to see if there was a correlation between fry survival and flow events and the contribution to adult returns. He mentioned he had found a positive correlation on the Stanislaus between flow events and fry survival.

J. Kindopp spoke briefly of the use of pit tags on steelhead trout in the Feather River to study growth. He also mentioned that they had CWT'd ~250K Spring Chinook(?) this last year.

B. Poytress noted that in addition to Bismark Brown marking for standard efficiency studies, he hoped to use spray-dye techniques to further investigate the relationship between size of fish at release and trap efficiency. Data from the previous 99 trials indicates that fish size may be an important factor for trap efficiency and this may be something that can be incorporated into the RBDD trap efficiency regression model.

S. Gaither/D. Colby noted that they must dual mark (caudal clip and bismark brown) on Battle and Clear Creek because they have an upper and a lower 5ft rotary trap on each stream and need to conduct independent efficiency trials.

M. Workman's group has been CWT'ing RBT's on the Mokelumne. The release data can be found on ARMIS, yet the recovery data is lacking. Michelle stated that they will use fin clips only to evaluate rotary trap efficiency for fry sized individuals (typically Dec-Feb), conducting trials when there are changes in flow patterns or fish size. She says that as fish leave the fry stage, they use photonic marks on caudal fins to evaluate efficiency.

A. Ammann has received CALFED approval to conduct a migration and survival study of 150mm+ Coleman National Fish Hatchery steelhead and late-fall Chinook. The intent was to use wild fish, but it is difficult to get a decent sample size from rotary traps or other means in the upper Sacramento River. Fish will be released at Coleman into Battle Creek, following a surgery recovery period (~10 days), and will be tracked as they migrate out past the Golden Gate Bridge and perhaps beyond.

J.D. Wikert noted that SP Cramer and Associates will likely conduct rotary trap calibration studies on the Stanislaus.

B) Presentations of marking techniques:

- Jason Kindopp (DWR) – *Mark and recapture techniques for salmon and steelhead on the lower Feather River.*

Jason thoroughly explained a variety of marking techniques they use and have used in recent years. He explained the pro's and con's of short term marks such as Bismark Brown stain, photonic marks, visible implant elastomers, visible implant alpha tags as well as longer term marking techniques such as pit tags, cwt's and otolith thermal marks. A summary of conclusions for the techniques he has used are:

<u>Marking Technique</u>	<u>Conclusion</u>
Bismark Brown	Easily applied & recognized, not too versatile
Photonics (Gun)	OK, somewhat unreliable, depends on applicator
Photonics (Pen)	Fair, no Co2 needed, portable, easily seen in nose
Visible Implant Elastomer	Easily detected, cheap, easy-2-use, good for fry size
Soft Alpha Tag	good for >150mm fish, individual mark but expensive (1\$/tag)
Pit tags	Passive, unique ID, expensive (\$4.50/tag), larger fish better
CWT's	Many recovery programs in place, expansive data sets, but requires careful application and recovery can be difficult
Otolith Thermal Marking	100% production marking feasible, recovery less intensive than CWT, somewhat expensive and requires careful planning and implementation, not used in CA much so far

- Bill Poytress (RBFWO) – *Feasibility of Dual Marking Age-0 Chinook Salmon for Mark-Recapture Studies.*

Bill presented information about a study that had been conducted at the Red Bluff Office in previous years to determine if the use of spray-dye techniques in combination with bismark brown stain resulted in significant difference in mortality between treatment groups and control groups. The study was performed by former JMPWT chairmen Phillip Gaines and an associate and has been published in the North American Journal of Fisheries Management as a management brief (November 2004). Bill noted that the technique is a feasible method for low cost mass marking of salmonids and the fish can easily be recognized when recaptured due to the bismark stain. The spray-dye used to assign fish to individual release groups must then be viewed under UV light.

The results of the study indicated that no statistical differences or biological differences were detected in the mortality rates of the control and treatment groups. Cumulative mortality for all groups was <1%. The procedure allows for the investigation of multiple release strategies (i.e simultaneous hatchery/wild release, differing size classes, or releases that occur in close temporal proximity). The spray-dye, although somewhat difficult to locate at time, can be obtained and interested parties should see Bill for contact information. Overall the technique has proven very useful to the Red Bluff office and it has allowed them to create the trap efficiency model that is currently in use.

Lunch Break : 12:30 to 13:15

- Arnold Ammann (NOAA/NMFS) - *Designing a salmonid smolt tracking study using ultrasonic tags with results from an experiment examining the effect of dummy tags on growth and swimming performance in juvenile steelhead trout.*

Arnold described an ultrasonic tagging study that has been approved by CALFED to investigate reach specific survival and movement patterns in 150+ mm hatchery steelhead and late-fall Chinook. Additional objectives are to attempt to explain the variations in the rates of movement observed.

To determine the feasibility of the study Arnold conducted a pilot study to measure the effect(s) of implanting dummy tags into fish of the size class to be used in the tracking experiment.

The tags and receivers to be used in the study are to be purchased from the Vemco corporation and the system as a whole is reasonably priced. Arnold described two types of transmitters, continuous versus coded, and noted the battery life is reduced using the continuous as compared to the coded. Arnold illustrated the advantages and disadvantages of the ultrasonic tags. In summary:

<u>Advantages</u>	<u>Disadvantages</u>
- Ease of recapture (passive)	- Tags large (use on >120mm smolts only)
- Inexpensive to monitor 24-7-365	- Tags are expensive
- Individual tag codes available	- Must retrieve receivers
- System expandable	

Arnold noted that the tag size and life to be used for the upcoming study was determined by looking at CWT data for fish released from Battle Creek and recaptured at the Golden Gate Bridge. The average migration time was ~63.5 days and therefore a tag that had a battery life of ~60 days is to be used.

For the pilot study (dummy tag implant), clove oil was used as an anesthetic, and fish were placed up-side-down into a V-groove holding device whereby an incision was cut into the underbelly and a dummy tag of equal weight was implanted. The results of the pilot study indicated that sutures healed in ~30 days after surgery, there were no significant differences in growth between control and treatment groups and there were also no significant difference detected in swimming performance.

J.D. Wikert asked about the possibility of remote downloading of in-river receivers to which Arnold replied that the Vemco VR3 receiver can do this but the cost is high at this time. To keep costs down on the proposal they decided to use manual downloading receivers.

Possible outcomes of the study (What Ifs?):

Survival is high - Study longer reaches

Survival is low - Release fish lower in the system

Predation occurs - Look at the behavior of the fish and if unusual it can be assumed to be preyed upon.

Likely information to be derived from the tracking study will be greater information on migration and survival rates of salmonids as well as a better understanding of the factors affecting mortality.

Questions following presentation:

-**J.D. Wikert** asked about data availability and Arnold responded that it will be uploaded to a website.

-**B. Poytress** asked why 200 fish were to be used as opposed to 500 or more. Arnold responded that cost was the main force behind using a relatively small sample of fish for the pilot study. From the data derived from the 200 fish, they will figure the next step in the project.

-**T. McReynolds** mentioned concerns about using hatchery fish and how this is to relate to wild population movement patterns. Hatchery fish were the only fish available at this point in the size class available to be tagged.

-**J. Kindopp** asked if Arnold was concerned about delayed movement after tagging and holding periods of 30 days. Arnold responded that they will hold fish less than 30 days (~10 days) but tags can be activated by a delay mechanism preset by Vemco.

V. Tentative Agenda Items for the proposed December 7th meeting:

The proposed next meeting of the Juvenile Monitoring Project Work Team is Wednesday December 7, the topic being *Hatchery vs. Wild Juvenile Fish Migratory Behavior Patterns (a look at the magnitude of hatchery influence)*.

Possible presentations:

M. Workmann- A Look at Volitional Releases on the Mokelumne.

E. Chappell- Spring Surrogate Release Data Compilation.

J. Williams- Literature Review of Migratory Behavior.

B. Poytress- Migration timing and magnitude of hatch and wild fish derived from trapping data following upper Sacramento River hatchery releases.